Testimony before the
House Committee on Energy & Environmental Protection

March 15, 2016, 8:30 am
Conference Room 325

S.B. No. 2604, S.D. 1 – Relating to a Microgrid Pilot Project for Schools

By Scott Seu
Vice President, System Operation
Hawaiian Electric Company, Inc.

Chair Lee, Vice-Chair Lowen and Members of the Committee:

My name is Scott Seu. I am Vice President for System Operation at Hawaiian Electric Company. I am testifying on behalf of Hawaiian Electric and its subsidiary utilities, Maui Electric and Hawaii Electric Light (collectively "Companies").

This bill should be amended to require that the microgrid pilot project be capable of both on-grid and off-grid operation. The optimal microgrid is one that not only serves the needs of the microgrid owner but also can benefit all customers by complementing the operation of the regular grid, such as through demand response programs or other grid support activities. Participation in such programs increases overall societal benefits and supports the entire State in reaching its renewable energy goals, not to mention can provide additional revenues to the microgrid owner. Such a microgrid operates connected to the regular grid during normal conditions, but during emergencies like sustained power outages, the microgrid can be designed to separate from the regular grid and operate independently for resiliency purposes. The bill should be amended to reflect this operational structure, as opposed to requiring that the microgrid be off-grid at all times.

Microgrids should be explored in a flexible manner that seeks to maximize benefit to the Department of Education and to the rest of Hawaii's electric customers.

Thank you for this opportunity to testify.

OPTERRA
ENERGY SERVICES
1099 Alakea Street #2500
Honolulu, HI 96813

Testimony to the Committee on Energy & Environmental Protection
Tuesday, March 15, 2016 8:30 AM
Conference Room 325, State Capitol
RE: SENATE BILL 2604 SD1 RELATING TO A MICROGRID PILOT PROJECT FOR SCHOOLS

Chair Lee, Vice Chair Lowen and Members of the Energy and Environmental Protection Committee:

Opterra Energy Services, ("Opterra") **supports SB 2604**, SD1 which requires the Department of Education to establish an off-grid microgrid pilot project through the Ka Hei program at a school of its choosing.

Opterra is working with the Department of Education to deliver the Ka Hei program, a five-year endeavor launched in 2014. The program will integrate innovative energy technology with meaningful learning experiences, all while reducing energy costs. As a comprehensive energy and sustainability program, Ka Hei will transform the learning environment, reduce operational expenses and provide engaging educational opportunities for our students and community.

There are numerous advantages in establishing microgrid facilities at schools. First, microgrids can store energy produced during the day and use it at night, allowing the school to reach a net zero footprint. This is a currently a challenge for the schools as changes to the net energy metering program no longer allow for the rollover of credits from month to month. Given there is a lot of solar production in the summer when the schools are not in session, this energy is lost without new and innovative solutions.

Microgrids also increase energy resiliency, which is critical since over 200 schools serve as evacuation centers. In New Jersey in the wake of Superstorm Sandy, schools were identified as being one of several different public facilities that could benefit from the installation of microgrids to improve energy resiliency.

In addition, renewable energy is needed to sustain energy requirements for added load from new technologies to support 21st century learning such as computers, monitors, and heat abatement. Being able to properly size the renewable energy systems after maximizing energy efficiency first is critical.

Thank you for the opportunity to testify.

Sincerely,

Brian Kealoha

Regional Director

DAVID Y. IGE
GOVERNOR

LANCE A. MIZUMOTO
CHAIRPERSON

STATE OF HAWAIʻI
BOARD OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAIʻI 96804

House Committee on Energy and Environmental Protection

Tuesday, March 15, 2016
8:30 A.M.
Hawaiʻi State Capitol, Room 325

Senate Bill 2604, SD1, Relating to a Microgrid Pilot Project for Schools

Dear Chair Lee, Vice Chair Lowen, and Members of the Committee:

The Board of Education ("Board") voted to testify in support of the intent of Senate Bill 2604 SD1, which would establish an off-grid microgrid pilot project through the Department of Education's Ka Hei program.

The Board has been actively monitoring the Department of Education's efforts to increase the amount of renewable energy it purchases while reducing its consumption through energy efficiencies. The Board supports any program that will allow the Department of Education to reach its long-term sustainability, renewable energy, and energy efficiency goals.

Thank you for this opportunity to testify on behalf of the Board.

Very truly yours,

Lance A. Mizumoto
Chairperson

LATE

DAVID Y. IGE
GOVERNOR

KATHRYN S. MATAYOSHI
SUPERINTENDENT

STATE OF HAWAI`I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI`I 96804

Date: 03/15/2016
Time: 08:30 AM
Location: 325
Committee: House Energy & Environmental Protection

Department: Education

Person Testifying: Kathryn S. Matayoshi, Superintendent of Education

Title of Bill: SB 2604, SD1 RELATING TO A MICROGRID PILOT PROJECT FOR SCHOOLS.

Purpose of Bill: Requires the department of education to establish an off-grid microgrid pilot project through the Ka Hei program at a school of its choosing. (SD1)

Department's Position:
The Department of Education (DOE) supports this bill. The DOE has been engaged in an aggressive program to increase the amount of renewable energy it purchases as well as drive down consumption through energy efficiencies. As this program, called Ka Hei progressed, it has become clear that in order to take sustainability 'to the next level' it is necessary to look at strategies beyond renewable energy generation and energy efficiency - strategies such as microgrids.

Because microgrids are defined as 'a group of interconnected loads and distributed energy within defined electrical boundaries and can act as single controllable entities with respect to the utility grid', the establishment of microgrids at various schools sites can become integral components to an improved, more robust and flexible electrical utility.

As such, microgrids are aligned with the DOE's overall long range strategies regarding sustainability, renewable energy, and energy efficiency.

Thank you for the opportunity to provide this testimony.

HAWAII STATE TEACHERS ASSOCIATION
Teaching Today for Hawaii's Tomorrow

LATE

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TESTIMONY BEFORE THE HOUSE COMMITTEE ON
ENERGY & ENVIRONMENTAL PROTECTION

RE: SB 2604, SD1 - RELATING TO A MICROGRID PILOT PROJECT FOR SCHOOLS.

TUESDAY, MARCH 15, 2016

COREY ROSENLEE, PRESIDENT
HAWAII STATE TEACHERS ASSOCIATION

Chair Lee and Members of the Committee:

The Hawaii State Teachers Association **supports SB 2604, SD1**, relating to a microgrid pilot project for schools.

It's hot in Hawai'i. According to the National Weather Service, our state set over 50 high temperature records this summer, with the heat and humidity lingering well into the start of fall. In our schools, children and teachers alike became ill from the blistering conditions. Kalaheo High School science teacher Micah Pregitzer recorded temperatures as high as 108 degrees inside his classroom last August, telling reporters, "You're dripping in sweat when you're just sitting there grading papers by yourself with no students in the room. You get the room packed with 36, 38, sometimes 40 students, and it just boosts that temperature up even higher."

A recent study conducted by University of California at Los Angeles researchers showed that the percentile gap between students learning in air conditioned and non-air-conditioned environments can reach as much as 17 percent on achievement tests, clearly evincing the impact of a comfortable classroom environment on student success. In a longitudinal analysis contained in "Effects of the Physical Environment on Student Learning," moreover, Glen I. Earthman of Virginia Polytechnic Institute and State University found that students between 4th and 9th grade at demographically similar schools showed increased gains in reading

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vocabulary, total math, problem solving, math procedures, pre-writing, and editing at schools with air conditioning, as compared with peers from non-cooled schools.

Earthman demonstrated that the longer and more consistently students are exposed to classroom cooling, the better and more stable their performance gains tend to be. Conversely, students exposed to thermal conditioning for only short or intermittent periods of time achieved less than their peers. These findings are supported by U.S. Department of Education sponsored research, which claims that proper cooling systems lead to better attitudes toward learning, fewer disciplinary problems, and sustained achievement.

We applaud Gov. David Ige's call to cool 1,000 classrooms within the next two years. While previous department of education estimates put the cost of comprehensive air conditioning at $1.5 billion, that figure has been fallen as investments in experiments with renewable energy technology have proven fruitful. Furthermore, in conversations with photovoltaic companies, advocates for cool schools have learned that employing off-grid DC-powered air conditioners, operated entirely from photovoltaic modules that store energy in power-saving batteries, could cost between $15,000 to $30,000 per classroom, a savings of approximately 70 percent from earlier departmental projections.

Accordingly, HSTA supports all efforts to provide climate control to classrooms using renewable energy technology. We believe, as the preamble to this bill states, that microgrids provide many benefits, including power security when an electrical grid falters, integration of clean and renewable energy, advancement of environmental standards, reduction of grid congestion, and localization of energy production. The DOE's Ka Hei program, through a public-private partnership with OpTerra Energy Services, already provides technical and financial expertise to help reduce energy costs throughout the department, making the program an ideal and economical generator of clean energy cooling and scientific learning.

School should be cool. To improve air conditioning facilities and, in turn, boost student learning, the Hawaii State Teachers Association asks your committee to **support** this bill.

LATE

From: mailinglist@capitol.hawaii.gov
Sent: Monday, March 14, 2016 7:02 PM
To: EEPtestimony
Cc: davidsher@juno.com
Subject: *Submitted testimony for SB2604 on Mar 15, 2016 08:30AM*

SB2604
Submitted on: 3/14/2016
Testimony for EEP on Mar 15, 2016 08:30AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Sherry Pollack	Individual	Support	No

Comments:

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

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LATE

March 14, 2016

Representative Chris Lee, Chair
Representative Nicole E. Lowen, Vice Chair
Committee on Energy & Environmental Protection

Comments and Proposed Amendments to SB 2604, SD1 Relating to A Microgrid Project for Schools. (Requires the Department of Education to establish an off-grid microgrid pilot project through the Ka Hei program at a school of its choosing.)

EEP Hearing: Tuesday, March 15, 2016, 8:30 a.m., Conf. Rm. 325

The Land Use Research Foundation of Hawaii (LURF) is a private, non-profit research and trade association whose members include major Hawaii landowners, developers and a utility company. One of LURF's missions is to advocate for reasonable, rational and equitable land use planning, legislation and regulations that encourage well-planned economic growth and development, while safeguarding Hawaii's significant natural and cultural resources and public health and safety.

LURF appreciates the opportunity to express its support for the intent of SB 2604, SDS1, and **COMMENTS AND PROPOSED AMENDMENTS** to require DOE's microgrid pilot project to be capable of both *on-grid* and *off-grid* operation.

SB 2604, SD1. The current measure would require the Department of Education (DOE) to establish only an *off-grid* microgrid pilot project through its Ka Hei program at a school of its choosing.

LURF's Position. Based on the comments below, LURF believes that in the best interests of the DOE and the public, **SB 2604 , SD1, should be amended** to require DOE's microgrid pilot project to be capable of both *on-grid* and *off-grid* operation.

LURF understands that the proposed DOE microgrid project is meant to address the current high electricity usage and costs at DOE schools and further expected increased costs due to future plans to install heat abatement measures at DOE schools for an improved learning environment.

The DOE microgrid project is also desirable because DOE schools are currently vulnerable to power grid failures during a disaster or emergency, notwithstanding the fact that many DOE schools also serve as emergency shelters and disaster response centers during hurricanes, and other natural disasters and civic emergencies.

The bill proposes to develop DOE's pilot microgrid project through its Ka Hei program, which is designed to boost student success through the implementation of renewable energy sources, campus modernization, and increased real-world educational opportunities in science, technology, engineering, and math.

LURF understands that microgrids are a group of interconnected loads and distributed energy within defined electrical boundaries that can act as single controllable entities with respect to the power grid. Using microgrids to provide energy to DOE schools can lower DOE 's electricity costs; reduce the load on the island's power grid; provide reliable energy to a school site/disaster response center during emergencies, and help the State progress toward its renewable portfolio standard goal of one hundred per cent by 2045.

While the Department of Education may not be able to install and use microgrids at all public schools immediately, the establishment of a microgrid pilot project will provide the DOE with the information it needs to eventually install and use microgrids across all public schools effectively and efficiently.

LURF **supports a proposed amendment** to this bill to require that DOE's microgrid pilot project be capable of both *on-grid* and *off-grid* operation, which would provide the *"best of both worlds"* for DOE – as its microgrid could operate connected to the regular grid during normal conditions and take advantage of the electric utilities' expertise, infrastructure and services, but during emergencies like sustained power outages or natural disasters, the microgrid can be designed to separate from the regular grid and operate independently for resiliency purposes. This measure should be **amended** to reflect this *dual* operational structure, as opposed to requiring that the microgrid be *off-grid* at all times.

For the above reasons, LURF **supports the amendment of SB 2604, SD1**, and respectfully urges your favorable consideration.

Thank you for the opportunity to present testimony regarding this matter.